UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
BIN C15700
Seattle, WA 98115-0070

February 12, 2003

Michael Kulbacki
Area Engineer
Federal Highway Administration
711 Capitol Way South, Suite 501
Olympia, Washington 98501-1284

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the SR 240 Yakima River Bridge Replacement Project (2002/00209)

Dear Mr. Kulbacki:

In accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended, 16 U.S.C. 1531, *et seq*. and the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, the attached document transmits the National Marine Fisheries Service (National Oceanic and Atmospheric Administration [NOAA Fisheries]) Biological Opinion (Opinion) and Essential Fish Habitat consultation under the MSA for the subject proposed action. The underlying construction project includes removing an existing substandard bridge and constructing two new bridges in the same location. Construction will occur at the mouth of the Yakima River near the cities of Richland and Kennewick in Benton County, Washington. The Federal Highway Administration (FHWA) determined that the proposed action was likely to adversely affect the Middle Columbia River steelhead (*Oncorhynchus mykiss*) Evolutionarily Significant Unit (ESU), and requested formal consultation.

The Opinion reflects the results of a formal ESA consultation and contains an effects analysis for listed Middle Columbia River steelhead in the Yakima River and its confluence with the Columbia River in Washington State. The Opinion is based on information provided in the Biological Assessment (BA), in subsequent meetings and addenda provided to NOAA Fisheries, and in telephone conversations and e-mail. A complete record of this consultation is on file at the Washington Habitat Branch Office.

The NOAA Fisheries concludes that implementation of the proposed project is not likely to jeopardize the continued existence of Middle Columbia River steelhead. The Opinion contains an incidental take statement (ITS), that accounts for the estimated extent of probable take of listed salmonids. The ITS provides Reasonable and Prudent Measures to be carried out through the provided Terms and Conditions, to ensure that incidental take is appropriately minimized. Failure to conduct the project as described, or to implement the terms and conditions in the ITS will be a basis for reinitiating formal consultation.

The MSA consultation concludes that the proposed project may adversely impact designated Essential Fish Habitat (EFH) for chinook (*O. tshawytscha*) and coho (*O. kisutch*) salmon. The Reasonable and Prudent Measures of the ESA consultation, Terms and Conditions identified therein, would address the negative effects resulting from the proposed FHWA actions. Therefore, NOAA Fisheries recommends that FHWA and its designated non-Federal representative implement them as EFH conservation measures.

If you have any questions, please contact Diane Driscoll of the Washington Habitat Branch Ellensburg Field Office at (509) 925-2638.

Sincerely,

D. Robert Lohn
Regional Administrator

Enclosure

cc: Paul Wagner, WSDOT
Pat McQueary, WSDOT

Endangered Species Act - Section 7 Consultation

Biological Opinion

and

Magnuson-Stevens Fishery Conservation and Management Act

Essential Fish Habitat Consultation

SR 240 Yakima River Bridge Replacement
Benton County, Washington
2002/00209

Agency: Federal Highway Administration

Consultation Conducted By: National Marine Fisheries Service
Northwest Region

Issued by: for [signature] Date: February 12, 2003

D. Robert Lohn
Regional Administrator

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1.0 INTRODUCTION

1.1 Background

This document transmits the National Marine Fisheries Service (National Oceanic and Atmospheric Administration Fisheries [NOAA Fisheries]) Biological Opinion (Opinion) and Essential Fish Habitat (EFH) consultation under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) based on our review of a project to replace the existing four lane SR 240 Yakima River Bridge in Benton County, Washington, with two new bridges, four lanes each. The Yakima River bridge crosses the Yakima River at the confluence with the Columbia River and includes the Middle Columbia River (MCR) evolutionary significant unit (ESU) for threatened steelhead (*Oncorhynchus mykiss*). This area has been designated as EFH for chinook and coho (*O. kisutch*) salmon. The area is used by each of these ESUs as a migration corridor and therefore, the analysis of effects in the Opinion is applicable in the EFH consultation.

1.2 Consultation History

On February 21, 2002, NOAA Fisheries received a Biological Assessment (BA) from the Federal Highway Administration (FHWA) and the Washington State Department of Transportation (WSDOT). The proposed project included the replacement of the existing Yakima River bridge, modifying the Richland Wye Interchange by constructing an on-ramp bridge, widening existing ramps, and constructing a new interchange at the Columbia Center Boulevard crossing on SR 240.

NOAA Fisheries requested additional information be submitted by WSDOT to complete the initiation package. On May 22, 2002, WSDOT requested by phone and electronic mail that consultation continue only on the bridge replacement portion of the project. After a site visit and receipt of additional information, formal consultation and EFH consultation for replacement of the existing bridge was initiated on July 10, 2002.

Additionally, many telephone conversations and e-mail correspondence between NOAA Fisheries staff, WSDOT, FHWA, and Washington Department of Fish and Wildlife (WDFW) are included in the administrative record.

The FHWA concluded that the project proposed by WSDOT is likely to adversely effect MCR steelhead, Upper Columbia River (UCR) steelhead, and UCR chinook. After review and analysis of the proposed action NOAA Fisheries concurred with "may affect, likely to adversely affect" MCR steelhead and determined that the action was " not likely to adversely affect" UCR steelhead and UCR chinook. Therefore, this Opinion addresses only MCR steelhead.

The objective of the Opinion is to present NOAA Fisheries' opinion on whether the proposed action is likely to jeopardize the continued existence of MCR steelhead. The Opinion was completed pursuant to the Endangered Species Act (ESA) and its implementing regulations (50 C.F.R. 402), and constitutes formal consultation under the ESA for MCR steelhead. The objectives of the EFH consultation is to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset those adverse effects.

1.3 Description of the Proposed Action

The FHWA proposes to fund, in whole or in part, replacement by WSDOT of the existing Yakima River bridge on SR 240 with two adjacent bridges. The existing bridge is considered scour critical and is ranked first in Washington State for replacement because of severe footing scour, substandard width, and structural deficiencies. The two replacement bridges will be constructed to accommodate the 500 year floodplain of the Yakima River. The existing bridge covers 36,210 square feet, and has six piers (spread footings), with two in the channel. Total streambed area currently covered by concrete piers is 2,486 square feet. The two new bridges require a total of 12 drilled shafts within the channel that will impact less than one thousand square feet (total) of streambed. The proposal also includes a bicycle/pedestrian path on the bridge to fulfill a 1970 commitment to connect this section of SR 240 with the balance of the pathways in the Tri-Cities.

The bridge replacement is expected to occur in three phases over a period of three years. Phase one will include constructing the westerly bridge and its bridge embankments, next to and on the west side (upstream) of the existing structure. During phase two traffic will be detoured onto the new bridge to allow demolition of the existing structure, and completion of the in-water work for the second bridge. The final phase of the project will be to complete the superstructure of the second bridge, all adjoining ramp lines and bicycle path, and open both bridges and path to revised traffic patterns. In-water work related to this project consists of placement of temporary work platforms, constructing the drilled shafts for the new bridge piers, placement of bank protection under the bridge, and removing the two existing in-water pier columns during demolition of the existing bridge. All in-water work will occur during the appropriate fisheries work window for the lower Yakima River.

1.3.1 Temporary Work Platforms

Temporary work platforms or trestles are needed to provide access to pier locations within the river. The platforms will be positioned on in-water barges or constructed on temporary steel pilings in the riverbed. The first temporary work platform will be built immediately upstream of the proposed location for the new westerly bridge, above the 100 year flood elevation. Using the existing bike path for access, steel piles will be either pile driven or vibratory hammered into the substrate. Approximately one-third of the piles will need to be placed within the active channel. The temporary platform will be a steel or an untreated timber deck placed on the pilings. A containment system (diapering with tarps and/or netting) will be installed to prevent material from entering the stream channel or wetlands. Finger piers perpendicular to the work bridge will be built next to the drilled shaft locations to provide access for shaft construction. When the temporary platforms are removed, the piles will be pulled vertically from the substrate or cut off at or below the streambed elevation. If WSDOT is successful in removing the pilings from the substrate, all residual holes will be completely filled with clean gravel. If pilings are cut and left in the riverbed, WSDOT will excavate the cut pilings to a depth of at least one foot beneath the streambed and backfill with clean gravel.

1.3.2 Shaft Foundations

In-water drilled shaft construction will be done from the finger piers of the work bridges. Steel cylinders ("cans") about nine feet in diameter will be placed at the shaft locations to act as cofferdams. Pumps screened to NOAA Fisheries guidelines (NMFS 2000) will be used to remove water from within the cans and any fish will be removed by dipnetting and released back into nearby flowing water. A concrete seal may be placed at the shaft locations to limit water intrusion. A casing will be placed within the cofferdam and progressively vibrated or rotated through the seal and into the substrate. As the casing descends, a clamshell or auger will remove the spoils from within the casing and place them in containers on the work bridge. When the final depth has been reached, a large rebar reinforcing cage will be placed in the excavated shaft and concrete will be pumped into the bottom of the shaft. As concrete fills the shaft, the casing will be progressively removed and all turbid or concrete laden water will be pumped to an upland site and treated or hauled to an approved disposal site. Any upland site used for biofiltration will be at least 300 feet from any waterbody or a location that ensures removal of pollutants and return to normal pH levels (must meet or exceed receiving water quality conditions). The bridge columns, crossbeams, and abutments will then be formed and poured on the foundation shafts. After the piers have been installed and the concrete has cured, the cans will be removed. The remaining construction of the bridge superstructure will take place from the work trestle structure, the streambanks or from barges.

1.3.3 Superstructure and Approach Road

Once the shafts, columns, and other substructure elements are completed, girders will be placed and the bridge deck, false work or forms will be built, and approach slabs and traffic barriers will be poured. The concrete bridge abutments will be poured-in-place concrete. Final steps will include asphalt paving, guardrail placement, and striping the roadway. Since these activities do not involve in-water work, they will continue after the in-water work period ends. Stormwater will be directed off the bridge using pipes or curbing and treated by infiltration or biofiltration swales.

Following installation of temporary erosion and sediment control measures, upland work will commence, including mowing, clearing and grubbing, grading, and stabilization of the bridge approaches. The total area required for clearing is approximately nine acres, this includes less than 0.5 acres of wetland. Approximately 43,000 cubic yards of fill are necessary to build approaches to the new bridges. The fill quantity will be minimized by confining slopes to a structural ratio of two to one with guardrails.

Filling associated with the approach road includes approximately one-half acres of wetland. The wetland area is an intermittent, artificial, drainage ditch at the toe of the existing slope along the length of the SR 240 causeway and is bordered by the Port of Benton Railroad to the west. The ditch is encumbered by man made grade control structures and berms that were likely constructed to help supply irrigation to this portion of the Yakima River Delta that had historically been in agriculture. The new ditch will be directly to the west of the existing ditch, along the toe of the new bridge approach. Additional work that will occur outside the fish work window includes asphalt and cement concrete pavement, installation of barriers, permanent signing, delineation, pavement markings and illumination systems.

1.3.4 Removal of Existing, Deficient Structure

The temporary bridge will remain in place while the first new bridge is built. At the next available in-water work window, the temporary bridge will be dismantled and reassembled immediately downstream of the current, deficient bridge. The current bridge will then be cut into pieces and removed to an approved site. The old bridge structure will be “diapered” to prevent any debris from entering the river or nearby wetland. Along with removal of the bridge superstructure and substructure, the existing bridge footings will be cut apart and removed approximately one foot below the existing streambed. After removal of the old bridge and pier columns, a second new bridge will be built using the same process described above.

1.3.5 Bank Protection and Revegetation

On the north shore, the existing bank and bike path is constructed from fill and will be removed and replaced with wetland as part of the wetland mitigation. Upon completion of the project this area will be beneath the upstream bridge. A total of one acre of new wetland will be created under the new bridges (both north and south shores), along the western edge of the new bridge approach, and on the south side of the river.

The bridge abutments will need to be protected from high flows. On the steep north bank the bridge abutment will be approximately 50 feet from the ordinary high water mark (OHWM) and will be protected with clean riprap. On the south bank, the abutment will also be protected with riprap but the location is more than 200 feet outside the OHWM and will only experience flows during a 500 year event. Additional wetland area will be created along the south bank, approximately 250 or more feet from the channel to the 500 year flood elevation. Clean, washed, riprap will be placed, not dumped, to protect the abutments. Clean rock will be used without the addition of a log structure because of the high numbers of salmonid predators in the area. The creation of a log structure in this shaded location would likely be more beneficial to predators because listed species are not known to rear in the area; rather, they migrate through it. Revegetation of the project vicinity is expected to be the most long-term stabilizing element of the proposed project mitigation. An extensive revegetation proposal is described in the BA. Timing of the revegetation scheme will be designed to meet the appropriate planting windows. Native vegetation disturbed during the proposed activities will be collected and transplanted, when possible, into appropriate areas requiring revegetation.

1.4 Description of the Action Area

Under the ESA, the "Action Area" is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area of the action (50 C.F.R. 402.02 and 402.14(h)(2)). The SR 240 bridge crosses the Yakima River at the confluence with the Columbia River, six miles upstream of McNary Dam and 10 miles upstream of the Snake River confluence. The Yakima River delta forms a "stagnation zone" Bureau of Reclamation (BOR) (1998), from the SR 240 bridge downstream approximately one and one-half miles. The McNary Dam causes a large pool at the mouth of the Yakima River, turning a lotic system into a lentic system within the action area.

The Yakima River is one of the principal tributaries of the Columbia River, entering at RM 335.2. The Yakima River has historically supported large returns of anadromous salmonids each year. The action area is in the Yakima River subbasin, and includes the Yakima River downstream of the Port of Benton Railroad and several hundred feet into the Yakima River delta (Lake Wallula). The action area also includes SR 240 from mile post (MP) 36 to MP 39, the adjacent riparian zone with the construction area and all areas affected by the project including the staging area, stormwater facilities and roadsides.

2.0 ENDANGERED SPECIES ACT

2.1 Biological Opinion

The Objective of this Opinion is to determine whether the proposed project is likely to jeopardize the continued existence of MCR steelhead.

2.1.1 Status of Species and Critical Habitat

The listing status and biological information, for the NOAA Fisheries listed species are described in Table 1.

Table 1. References to Federal Register Notices and Status Reviews Containing Additional Information Concerning Listing status, Biological Information, and Critical Habitat Designations for Listed Species Considered in this Opinion.

Species	**Listing Status Reference**	**Critical Habitat Reference**	**Biological Information**
Middle Columbia River (MCR) steelhead (*O. mykiss*)	Threatened Species, March 25, 1999 (64 Fed. Reg. 14517)	No Designated Critical Habitat	Status Review of West Coast Steelhead from Washington, Idaho, Oregon and California, (Busby *et al.*, 1996)

The information presented below summarizes the status of species and ESUs that are the subject of this consultation.

2.1.1.1 MCR Steelhead

MCR steelhead were listed as threatened under the ESA on March 25, 1999 (64 Fed. Reg. 14517). In Washington, the MCR steelhead ESU includes winter and summer steelhead in tributaries to the Columbia River above the Wind River upstream to include the Yakima River (Busby *et al*. 1996). Steelhead of the Snake River Basin are not included. Critical habitat is not presently designated for MCR steelhead.

Summer steelhead generally return to freshwater between May and October after spending one or, more commonly, two years in oceanic waters (Busby *et al*. 1996, Wydowski and Whitney 1979). In wild populations, juveniles generally migrate to sea at age two, but hatchery conditions permit steelhead to smolt after only a single year (Wydowski and Whitney 1979). Returning steelhead in the Columbia River generally spend an additional year in freshwater before spawning (Wydowski and Whitney 1979). In Washington, most populations begin spawning in February or March (Busby *et al*. 1996). In the Yakima River subbasin, yearling smolt outmigration begins as early as February and continues into late June and early July. Smolt monitoring in the Yakima River at Chandler Dam (RM 46) indicates that most juvenile outmigration has occurred by early June but a few are still seen into the first week of July (Yakima-Klickitat Fisheries Project [YKFP]). Adult migration can begin in September and generally peaks in mid-late November. Adult fish counts at Chandler Dam in 1999 through 2001 indicated that between four and ten percent of adults move up the Yakima River before September 30 (YKFP).

Six stocks of steelhead within the MCR ESU were identified as at risk of extinction or of special concern (Nehlsen *et al*. 1991). Busby *et al*. (1996) noted that the Yakima River stock was of particular concern and may be at risk of extinction. Estimates of historical, pre-1960s abundance for the Yakima River is 100,000 (WDFW *et al*. 1993). Haring (2001) reports a range of estimates from 20,800 to 100,000 and an Ecosystem Diagnosis and Treatment (EDT) simulation estimated a population of 43,000 adults. Busby *et al*. (1996) reported that there was an average escapement of 1,300, with a natural escapement of 1,200 in the Yakima River. These numbers represent an increasing trend from extremely low escapements in the early 1980's. More recently, Haring (2001) reported Yakima stocks averaging 1,256 fish (ranging as low as 505 in 1996 to 2,840 in 1988). Escapement levels in the past two decades have fluctuated and low escapements in the mid-1990s (505-925 fish) represent 1.3% of the historical run. Several factors have contributed to the decline of MCR steelhead including habitat degradation through grazing and water diversion, overharvest, predation, hydroelectric dams, hatchery introgression, drought and other natural or human-induced factors (Busby *et al*. 1996). Based on estimates from the Yakima River before 1960, if we assume that other basins had comparable run sizes for their drainage areas, the total historical run size for this ESU might have been in excess of 300,000. The most recent 5 year average run size (1989-1993) was 142,000 with a naturally produced component of 39,000. These data show approximately 74% hatchery run in the total run to this ESU (Busby *et al*. 1996). The current natural run size for the MCR ESU might be less than 15% of estimated historical levels. Haring (2001) reports: "Historically, steelhead were probably found wherever spring chinook were found, and in many other tributaries and reaches as well." Steelhead also spawn in intermittent streams, smaller streams, and in streams with steep gradients. Presently, steelhead are still found throughout most of the Yakima River and its tributaries where access is provided. Spawning is documented in Toppenish Creek, Satus Creek, Ahtanum Creek, Naches River system, the Upper Yakima River mainstem and a few tributaries. The majority of production in the Yakima is from Toppenish Creek and Satus Creek (Hockersmith *et al*. 1995). Upstream adult migration generally depends on temperature. Steelhead adults migrate up the Columbia mainstem during late spring and early summer when temperatures are low and flows are high. Adults will often remain in the cooler waters of the mainstem Columbia until tributary temperatures begin to decline in the fall, (preferring temperatures < 60° F.) when migration will continue. A radio-telemetry study by Hockersmith *et al*. (1995) indicated that returning adult steelhead exhibit three behavioral phases, a migratory phase, a winter holding phase and a spawning phase. Steelhead migrate into the Yakima River during fall and early winter as water temperatures decline and settle into holding areas when water temperatures reach approximately 40° F. More than 62% of the steelhead tracked by Hockersmith *et al* (1995) wintered in the mainstem Yakima River below Sunnyside Dam (RM 100). When flows and temperatures begin to increase in the spring, adults will move into spawning areas, in the Yakima subbasin this is generally February through March with the spawning peak in April. Surviving adults and 1-2 year-old smolts then migrate back downstream with spring flows. Because of observed migration patterns and unacceptable high water temperatures in the Yakima River during the summer and early fall, very few MCR steelhead are likely to be in the action area during in-water construction operations (June 30 to September 30).

Essential features of habitat for steelhead include adequate substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, and safe passage conditions. Recent and historical information related to abundance and life history is summarized in Busby *et al*. (1996).

2.1.2 Evaluating the Proposed Action

The standards for determining jeopardy and adverse modification of critical habitat are set forth in section 7(a)(2) of the ESA as defined by 50 C.F.R. 402.02 (the consultation regulations). For this analysis under section 7 of the ESA, NOAA Fisheries followed the guidance suggested in *The Habitat Approach, Implementation of Section 7 of the Endangered Species Act for Actions Affecting the Habitat of Pacific Anadromous Salmonids*, August 1999 (available online at: www.nwr.noaa.gov/1habcon/habweb/pubs/newjeop9.pdf). Using the habitat approach, NOAA Fisheries typically follow these steps when analyzing habitat-altering actions: (1) Consider the status and biological requirements of the species (2) evaluate the relevance of the environmental baseline in the action area to the species' current status, (3) determine the effects of the proposed or continuing action on the species, and whether the action is consistent with the available recovery strategy, (4) consider cumulative effects, and (5) determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of species survival in the wild (jeopardize the species). If NOAA Fisheries determines that the proposed action would jeopardize the affected species, the agency must identify reasonable and prudent alternatives for the action.

Recovery planning will help identify feasible measures that are important in each stage of the salmonid life cycle for conservation and survival within a reasonable time. In the absence of a final Recovery Plan, NOAA Fisheries must ascribe the appropriate significance to actions to the extent available information allows. NOAA Fisheries intends that recovery planning identify areas/stocks that are most critical to species conservation and recovery from which proposed actions can be evaluated for consistency under section 7(a)(2).

2.1.2.1 Biological Requirements

The first step NOAA Fisheries uses when applying the ESA section 7(a)(2) to the listed ESUs considered in this Opinion is to define the species' biological requirements within the action area. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species within the action area, NOAA Fisheries starts with the determinations made in its decision to list for ESA protection the ESUs considered in this Opinion and also considers any new data that is relevant to the determination. The relevant biological requirements are those necessary for salmon in each ESU to survive and recover to naturally reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

The biological requirements of MCR steelhead include food (invertebrates, forage fish), flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate, and unimpeded migratory access to and from spawning and rearing areas (adapted from Spence *et al*. 1996). Even slight modifications of these habitat elements can produce deleterious effects to MCR steelhead and their habitat. NOAA Fisheries has related the biological requirements for listed salmonids to a number of habitat attributes, or pathways, in the Matrix of Pathways and Indicators (MPI). These pathways (Water Quality, Habitat Access, Habitat Elements, Channel Condition and Dynamics, Flow/Hydrology, and Watershed Conditions) indirectly measure the baseline biological health of listed salmon populations through the health of their habitat. Specifically, each pathway comprises a series of individual indicators (*e.g.*, indicators for Water Quality including temperature, sediment/turbidity, and chemical contamination/nutrients) measured or described directly (see, NMFS 1996). Based on the measurement or description, each indicator is classified within a category of the properly functioning condition (PFC) framework: (1) *properly functioning*, (2) *at risk*, or (3) *not properly functioning*. PFC is defined as "the sustained presence of natural habitat forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation." Without other information regarding the numbers of fish necessary to recover a species, NOAA Fisheries relies on the attainment and maintenance of the PFC within a watershed to determine that the biological requirements of the species are met. The relevant biological requirements for this consultation are water quality, substrate, food, and riparian habitat.

2.1.2.2 Environmental Baseline

The environmental baseline represents the current set of basal conditions to which the effects of the proposed action are then added. An environmental baseline is defined as "the past and present impacts of all Federal, State, and private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or informal section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation process" (50 C.F.R. 402.02).

The environmental baseline for the action area is most immediately affected by the existence of the bridge to be replaced. Additionally, the historic existence of complex and interconnected habitats created and maintained in the Columbia Basin through natural riverine processes, have declined as the result of human activities on the surrounding landscape. The historic availability of these habitats facilitated the expression of life history diversity and contributed to maintenance of production of salmonids. Today, much of that diversity has been lost due to degradation of both mainstem and subbasin habitats.

The action area is the Yakima River delta, in the Yakima River subbasin and to a lesser extent the mainstem Columbia River. The Yakima River functions as a migration corridor for listed MCR steelhead and MCR spring and fall chinook (unlisted) and coho (unlisted). Historically, salmonids used deltas or estuaries as prime refuge, rearing, and feeding areas. Significant manipulations of the delta area and its functions have altered its ability to provide appropriately functioning habitat.

2.1.2.2.1 Yakima River Subbasin

The geographic area occupied by this ESU forms part of the larger Columbia Basin Ecoregion (Omernik 1987). Climate in this area includes extremes in temperatures and precipitation, with most precipitation falling in the mountains as snow. Streamflow is provided by melting snowpack, groundwater, and runoff from alpine glaciers.

Vegetation in the subbasin is a complex blend of forest, range and cropland. Over one-third of the land in the Yakima Subbasin is forested. Most of the forested vegetation in the Yakima Subbasin is at the headwaters in the Cascade Mountains. The lower subbasin is dominated by agricultural land use with sporadic urbanized areas. Agriculture dominates the Yakima Basin landscape, especially in the lower region of the river basin. Agricultural lands compose about 62% of the watershed, while forest land managed for timber harvest cover 35%, and urban areas represent less than one percent of the watershed (Haring 2001). Remaining land uses include mining, wilderness, and hydroelectric projects.

The major habitat factors limiting steelhead production in the Yakima watershed are, in order of decreasing importance: 1) upstream and downstream passage at water diversions in the Yakima watershed, especially those on spawning tributaries, 2) non-normative instream flows (too low or too high) in the mainstem and tributaries, 3) degraded riparian and instream habitat, and, 4) excessive water temperature in the lower reaches of some tributaries and in the lower mainstem

Yakima River (Haring 2001). Steelhead are much more susceptible to existing passage and entrainment problems in the watershed than spring chinook. This is because steelhead spend more of their juvenile life in tributaries, and problems associated with diversions are relatively more severe on tributaries. Entrainment of newly emerged steelhead fry is a particular problem because steelhead emerge when diversions are at or near maximum, and they emerge at a size that often allows passage directly through the mesh of many fish screens. Steelhead passage in tributaries requires substantial flows from October through early December for spawners and juveniles seeking downstream winter habitat, and from March through late April or early May for spawners and smolts.

Impaired fish access is a prominent factor affecting salmonids in the basin; mostly associated with irrigation diversions and irrigation water storage throughout the watershed. Impassible irrigation storage dams were constructed on the upper Yakima River (Keechelus Dam), the Kachess River (Kachess Dam), the Cle Elum River (Cle Elum Dam), the Bumping River (Bumping Dam), and the Tieton River (Tieton Dam). These dams eliminated 112 miles of highly productive steelhead, coho, and chinook habitat and extirpated sockeye. The occurrence and severity of other habitat limiting factors varies between streams and reaches within individual subwatersheds. Current salmonid use is impaired to varying degrees throughout the watershed by loss of floodplain function (including loss of side channel habitats within the floodplain), loss of in-channel habitat diversity, loss of channel and bank stability, increased presence of fines in the substrate that impairs spawning and rearing success and benthic invertebrate productivity, impaired riparian function, water quality impacts from agricultural runoff, and perhaps most importantly, altered hydrology throughout much of the watershed (Haring 2001). High temperatures in the lower sections of the Yakima subbasin, resulting from watershed-wide habitat degradation, have severed the connectivity of the chain of habitats linking the Yakima subbasin to the mainstem Columbia and Snake. Lethal temperatures in the lower mainstem also eliminated several life history pathways in spring chinook salmon in the Yakima River (Watson 1992).

Slow, warm, pool conditions like those in the Yakima River delta provide favorable habitat for nonindigenous predatory finfish that prey on juvenile salmonids (*e.g.*, smallmouth bass (*Micropterus dolomieu*), largemouth bass (*M. salmoides*), channel catfish (*Ictalurus punctatus*) and indigenous northern pikeminnow (*Ptychocheilus oregonensis*).

2.1.2.2.2 Yakima River Delta

The natural delta of the Yakima River is highly altered because of pooling upstream of McNary Dam. The lower two miles of the historic Yakima River are inundated, reducing the extent of historic tributaries and off-channel rearing areas. (Snyder and Stanford 2001). Below Prosser (RM 47.1) the lower river frequently exceeds 75°F and occasionally reaches 80°F in July and August rendering the area uninhabitable by salmonids (Confederated Tribes Yakima Indian Nation [CTYIN], *et al*. 1990). The delta floodplain likely was very extensive and complex before the construction of McNary Dam on the Columbia River. Remnant riparian forests remain on exposed portions of the extensive alluvial delta (most of the original delta is submerged). The reach is substantially modified by inundation and erosion associated with McNary pool, but a substantial expanse of wetlands exists on the fringes. Surface and groundwater interactions appear to be dominated by infiltration of McNary pool water, which probably maintains the fringing wetlands.

The Yakima River confluence reach is best described now as an essentially lentic environment. The McNary pool backwater eliminates discernable current in the channel, which is several hundred yards wide. The mouth has been channelized and enters the Columbia as a single channel. Large woody debris is removed for navigation purposes and the substrate consists of fine sediments that drop out in this low velocity region. Substrate consists of deep mud and sand downstream of the SR 240 bridge crossing. A number of "cul de sacs" in the area are known to contain large numbers of smallmouth bass, and channel catfish are quite numerous in the main channel. The lack of instream cover, low water velocities, high water temperatures and dead-end "bays" all suggest this may be a region of especially high predation. Stomach content analysis in the lower Yakima River in 1998 (Haring 2001) revealed that juvenile chinook and steelhead represented 23% and 29% of the diet of northern pikeminnow and smallmouth bass respectively. Predation of smolts by smallmouth bass was estimated at 500,000 smolts per year.

Washington State Department of Ecology (WDOE) has monitored water quality in the lower Yakima River for many years. In 1998 (the last available listing year) the lower Yakima River was placed on the Clean Water Act 303(d) list for elevated temperature, and high levels of PCB's, 4,4'-DDE, and Dieldrin. At the Kiona station (RM 30) instream temperatures often rise above 70° F by late June and remain high well into September. Analysis of aerial thermography data (BOR 1998) indicated that the McNary Dam creates a "stagnation zone " (high temperatures and increased deposition) that extends from above the SR 240 bridge downstream to the Columbia River. Water temperatures in this stagnation zone exceeded 73° F and remained at or above this level for a distance of almost two miles before being moderated by the Columbia River. The BOR study also indicated that water temperatures in August were at or above 70° F from the mouth to approximately 70 miles upstream.

2.1.2.2.3 Columbia River

The mainstem dams on the Columbia River are the most prominent features that influence the environmental baseline within the action area. These dams have substantially changed the Columbia River's physical and biological characteristics. They have altered temperature profiles, inundated spawning habitat, created passage barriers, diminished sediment transport, altered seasonal flow patterns, imparted broad diel flow fluctuations, eliminated lotic channel characteristics, and created habitat for species that prey on or compete with salmonids.

In terms of MPI indicators, the dams have contributed to a broad range of habitat degradation in the mainstem Columbia and the Yakima River subbasin. At the Water Quality pathway, the regulation of the dams, creating slow-water reservoirs, water withdrawals and alteration of riparian vegetation have contributed to high instream temperatures. As a result, the MPI Temperature indicator is *not properly functioning*.

At the Habitat Elements pathway, all indicators are *not properly functioning*. Hydropower development has changed most of the Columbia River from a lotic system to a series of slow-moving reservoirs (NMFS 2000). Agricultural and development of the Yakima River have resulted in loss or simplification of riverine processes, and functional habitat. Sediment delivery has increased and transport has been restricted in the Columbia River to the extent that fine materials (silt, sand) settle out of the water column in the reservoirs (including the delta) instead of being flushed downstream (causing sedimentation) (NMFS 1996). Additionally, low water velocity and the physical presence of the dams (both upstream and in the action area) traps spawning substrates, preventing downstream recruitment (NMFS 1996). Off-channel habitat, refugia (remnant habitat that can buffer populations against extinction), and large woody debris production have been reduced by inundating off-channel areas and historic riparian zones. Because the flow is highly regulated, hydraulic variation is lacking. Consequently, pools, riffles and other instream habitat are greatly reduced or have been eliminated.

Within the Channel Condition and Dynamics pathway, the Floodplain Connectivity indicator is *functioning at risk*. Dam operations, flow (reservoir) management, and the related inundation of off-channel rearing and floodplain areas have reduced the size, quality, and functional capacity of existing floodplains at the confluence of the Yakima and Columbia Rivers (Snyder and Stanford 2001).

As for the Flow/Hydrology pathway, dams have affected the Change in Peak/Base Flows indicator to the extent that the indicator is *not properly functioning*. Dam operations, by nature, restrict and control the passage of water through river basins. Manipulation of flows for power and irrigation on the Columbia and Yakima Rivers affects the natural hydrograph by decreasing spring and summer flows and increasing fall and winter flows compared to unregulated systems (reversal of patterns seen in unregulated systems).

Overall, watershed conditions in the Yakima River subbasin and adjacent Columbia River are either *at risk or not properly functioning*. Urban development and agricultural uses have placed roads and developments in riparian areas, altered or destroyed riparian reserves, reversed the natural hydrograph and eliminated or severely altered the normal disturbance regime.

2.1.2.3 Factors Affecting the Species Environment within the Action Area

Section 4(a)(1) of the ESA and NOAA Fisheries listing regulations (50 C.F.R. 424) set forth procedures for listing species. The Secretary of Commerce must determine, through the regulatory process, if a species is endangered or threatened based upon any one or a combination of the following factors: (1) the present or threatened destruction, modification, or curtailment of its habitat or range, (2) overutilization for commercial, recreational, scientific, or educational purposes, (3) disease or predation, (4) inadequacy of existing regulatory mechanisms, or (5) other natural or human-made factors affecting its continued existence.

The proposed action includes activities that would have some level of effects with short-term impacts from category (1) and the potential for long-term impacts from category (3) to non-listed species. The characterization of these effects and a conclusion relating the effects to the continued existence of the subject species of this consultation are provided in Section 2.1.3.

Among the concerns regarding the species environment throughout the Yakima River subbasin are severely altered hydrographs, poor water quality, fish passage barriers, low habitat complexity, loss of floodplain function, impaired riparian function, and false attraction at irrigation returns. High temperatures in the lower sections of the Yakima subbasin, resulting from watershed-wide habitat degradation, have severed the connectivity of the chain of habitats linking the Yakima subbasin to the mainstem Columbia and Snake. Most of these surface water problems are associated with irrigated agriculture. Several areas of the Yakima, including the delta, have significant populations of non-indigenous and indigenous predators that prey on juvenile salmonids.

2.1.3 Effects of the Proposed Action

Replacement of the existing bridge and addition of another bridge at the mouth of the Yakima River is likely to adversely affect MCR steelhead. The action area is important to MCR steelhead mainly as a migration corridor and to a lesser extent as a rearing area for juvenile salmonids. Elevated summer temperatures have reduced its ability to provide juvenile rearing habitat. The ESA implementing regulations define "effects of the action" as "the direct and indirect effects of an action on the species or habitat together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline." Direct effects are immediate effects of the project on the species or its habitat, and indirect effects are those caused by the proposed action and are later in time, but are still reasonably certain to occur (50 C.F.R. 402.02).

2.1.3.1 Direct Effects

Direct effects result from the agency action and include the effects of interrelated and interdependent actions. Future Federal actions that are not direct effects of the action under consideration (and not included in the environmental baseline or treated as indirect effects) are not evaluated. The direct effects of the proposed bridge replacement project activities are discussed below.

2.1.3.1.1 Worksite Isolation

Initial placement of piles and construction of temporary work platforms will occur from the streambank. In-water construction sites will be isolated from the river through the use of steel cylinders ("cans") in which piles and other structure will be built. These measures are intended to reduce the effects of in-water construction on fish in the project area. The likelihood of can installation affecting MCR steelhead is remote. It is unlikely that fish will be trapped in the cans. In-water work activities will be timed to take advantage of periods when MCR steelhead are least likely to be using the action area. The likelihood of fish presence is further decreased by unsuitability of water temperatures during the in-water work window. Finally, initial in-water activities are likely to cause avoidance behavior in any fish that might be present. Juvenile outmigration peaks in May but a few fish are still seen in late June and early July. If any fish are found within the cylinders, they will be dipnetted and released immediately upstream in flowing water. Timing restrictions reduce the likelihood that listed species will be present during in-water work because outmigration is almost complete and few juvenile steelhead are seen past June 30 (YKFP) and because of the likelihood of high water temperatures. Finally, should can installation result in entrapment of any fish, the project calls for dipnetting to further minimize the effects of can installation on MCR steelhead.

2.1.3.1.2 Water Quality

Adverse effects associated with grading, excavation at the existing bridge site, and the back-filling and removal of the existing bridge footings are likely to include temporary increases in turbidity levels during construction. The turbidity standards for water quality might be exceeded for brief periods during construction. Adverse effects of increased sediment include deposition of fine sediment that can temporarily degrade instream spawning habitat (and suffocate any incubating eggs), and loss of intergravel cover for fish from increased sediment levels (Spence *et al*. 1996). Elevated turbidity levels can also reduce the ability of salmonids to detect prey and can cause gill damage (Sigler 1980; Lloyd *et al*. 1987). The proposed action includes several measures intended to reduce or eliminate such effects. Measures include restricted in-water work timing, clear marking of access areas to reduce ground disturbance, silt fencing, isolating the work area from the river with cofferdams, and preventing the discharge of excavated materials to the river. As a result, the adverse effects associated with in-water construction will be avoided or minimized. In-water construction timing restrictions will further reduce the risk that increased sediment mobilization will affect MCR steelhead. Any adult steelhead present during construction should be capable of seeking refugia or avoiding portions of the river with high turbidity and sediment levels. Overall, the increased turbidity and potential fine sediment deposition are unlikely to have any measurable effect on MCR steelhead after completion of construction activities.

2.1.3.1.3 Effects on the Streambed

Drilling holes into the riverbed for the construction of the temporary work bridge and new foundations will cause considerable disturbance to the riverbed. To a lesser extent, placement and removal of temporary structures, and filling of voids will disturb the Yakima riverbed. Any structures seated on the riverbed must be drilled into the bedrock. The construction of the new bridge requires drilling shafts into the riverbed (pile driven or vibratory hammer driven), crushing and excavating bedrock, and pouring concrete into the holes to build the foundations. The construction of the new bridge will require the use of a temporary work bridge, false towers, and cofferdams. These activities will disturb the riverbed. Temporary piles will be removed by vibratory hammer, direct pull or breaking/cutting at the substrate. The contractor will not use a clam shell to remove pilings.

Removal of the existing spread footings is also expected to disturb the streambed. FHWA will remove the footings in a way that minimizes impacts to the streambed substrate. The pieces will be lifted vertically out of the stream channel and not dragged or pulled laterally along the surface stream substrate. No heavy equipment or vehicles will enter the stream channel for this process. Any pieces of the footings that remain in the substrate will be broken up and removed by divers with handheld equipment.

Since the action area does not support MCR steelhead spawning, activities that affect the riverbed are not likely to adversely affect spawning behavior. The action area does serve as a migratory corridor, and a holding and rearing area for MCR steelhead. Construction activities, if conducted while listed fish were present, could affect migration, holding, and rearing behavior. However, since in-water work will occur when few if any listed fish are likely to be present, coupled with described minimization measures, it is unlikely that in-water activity will disrupt essential behaviors of listed species. Therefore, the effect on MCR steelhead is expected to be discountable.

2.1.3.1.4 Removal of Riparian/Wetland Vegetation and Bank Protection

Riparian vegetation generally links terrestrial and aquatic ecosystems, influences channel processes, contributes organic debris to streams, stabilizes streambanks, and modifies water temperatures (Gregory *et al*. 1991). Loss of vegetation might reduce allochthonous inputs (such as tree leaves) to the stream. Woody debris provides essential functions in streams including the formation of habitats. Additionally, the removal of streambank vegetation can decrease streambank stability and resistance to erosion. Riparian vegetation beneath the footprint of the new structure will be removed. Furthermore, it is possible that riparian vegetation will be affected by use of heavy machinery. The use of heavy equipment in the riparian areas can cause local compaction of soils resulting in reduced infiltration at the project site. Such compacting could decrease the stability of the banks and reduce recruitment of riparian vegetation, and perhaps lead to increased mobilization of fine sediments into the river. To minimize the disturbance of the riparian area and the channel, the contractor will: (1) work within the approved fish window, (2) work within the flagged work area, (3) limit heavy equipment to that with the least adverse effects on the environment and, (4) revegetate disturbed areas. Revegetation of riparian areas will include a mix of native seeds, shrubs, and trees planted according to the prescription and timing outlined in the BA and the WSDOT Highway Runoff Manual.

Approximately one-half acre of existing wetland habitat on the south shore (where the new bridge access road will be built) will be filled. WSDOT will construct approximately 1 acre of new wetland and enhance another one-half acre to offset the effects of lost wetland and riparian area. The new wetland will be created under the new bridge approach on both sides of the river and the enhancement will occur directly west of the relocated drainage ditch (west side of the bridge approach, south side of river). Increasing and improving wetland habitat is expected to be a positive effect. Wetlands in the area provide juvenile rearing and refuge as well as improving water quality. Enhancement of existing wetlands will include removal of invasive species and reestablishment of native wetland species. Construction techniques will require that vegetation in temporary fill areas is only mowed or otherwise treated to retain the existing root structure and maintain soil stability on the site.

The new bridge abutments will be protected by riprap. On the north shore (left bank) approximately 125 feet of shoreline below the abutment is currently protected with a mix of broken concrete, rock and asphalt. The proposed work will contour approximately 200 feet of shoreline on the left bank at a maximum slope of 2:1 and clean riprap will be placed within the channel up to the base of the abutment. On the south shore the abutment is more than 200 feet from the channel and placement of riprap will not affect fish. The use of clean washed rock riprap along the north shore has been approved instead of a log structure because of the high numbers of salmonid predators in the area. WSDOT decided not to install a log structure in this shaded location, because it would likely be more beneficial to predators such as smallmouth bass and northern pikeminnow, than to juvenile salmonids. By itself the addition of riprap still has the potential to create predator habitat. The current bank protection provides many large crevices that are excellent predator hiding cover. Removal of the existing riprap and replacement with the smallest possible size material for the new bank protection is intended to reduce, if not eliminate predator cover. Following placement of the clean washed rock, the area above water will be filled with topsoil and planted with willow cuttings. The angle of the bridge crossing is such that sunlight can reach approximately 50 to 100 feet under each side of the new structure. Bank revegetation should be enhanced over existing shoreline conditions. The overall effect of these activities on MCR steelhead habitat is likely to enable improved habitat function over existing conditions by increasing opportunity for the development of riparian vegetation and reducing the overall quality of predator habitat along the riprap bank (despite the increase in the amount of riprap bank.

2.1.3.1.5 Pile Driving/Percussive Impacts

When driving steel piles, impact hammers produce intense, sharp spikes of sound which can reach levels that harm or even kill fishes (*e.g.*, Frasier River Pile and Dredge [FRPD] Ltd. 2001; Washington State Ferries (WSF) 2001; NMFS 2002; J. Stadler, NOAA Fisheries, pers. comm. 2002). The extent to which the noise would disturb fish would be related to the distance between the sound source and affected fish and by the duration and intensity of pile driving. The type and intensity of the sounds produced during pile driving depend on a variety of factors including, but not limited to, pile type and size, the firmness of the substrate into which the pile is being driven, water depth, and the type and size of the pile-driving hammer.

Fishes may respond to the first few strikes of an impact hammer with a "startle" response. After these initial strikes, the startle response wanes and the fishes may remain within the field of a potentially-harmful sound (Sonalysts Inc. 1997; NMFS 2002). To elicit an avoidance response, a sound must be in the infrasound range (<20 Hz) and the fish must be exposed to the sound for several seconds (Enger *et al.* 1993; Knudsen *et al.* 1994; Sand *et al.* 2000). Such sounds are similar to those produced when piles are driven with a vibratory hammer. Impact hammers, however, produce such short spikes of sound with little energy in the infrasound range that avoidance is not elicited (Carlson *et al.* 2001). Thus, impact hammers may be harmful for two reasons: first they produce more intense pressure waves, and second, the sounds produced do not elicit an avoidance response in fishes, which will expose them for longer periods to those harmful pressures.

The effects of pile driving sound on fishes depends on several factors, including the sound pressure levels (SPL) being transmitted and the size and species of fish. There is little data on the SPL required to cause harm to fishes. Carlson *et al.* (2001) reported that impact driving of 12 inch diameter wood piles produced peak SPLs up to 195 decibels (dB) (re: 1µPa). Short-term exposure to SPLs above 180 dB (re:1 µPa) are thought to inflict physical harm on fishes

(Hastings 1995, cited in NMFS 2002). Based on the known range of hearing for salmon, Feist, *et al.* (1992) suggested that the sounds of impact driving of concrete piles were audible to salmon up to 656 yards (600 m) from the pile-driver, and that salmonids in close proximity < 11 feet (10 m) to pile driving may experience temporary or permanent hearing loss.

Growing evidence of the effects of pile driving has been demonstrated in the Pacific Northwest. Throughout the study of pile driving effects on juvenile salmonids, Feist (1991) found that pile installation operations affected the distribution and behavior of fish around the site. For example, the abundance of fish during non-pile driving days was twofold greater than on days when pile driving occurred. Additionally, salmonids were less responsive to the activity of observers on the shore during pile driving than during periods without pile driving. This reduced responsiveness may put them at greater risk of predation.

On several occasions, fish mortality and/or fish distress has been observed during installation of steel piles using impact hammers. At the Mukilteo ferry dock, during impact hammer installation of 24 inch and 30 inch diameter steel pilings, juvenile striped surfperch (*Embiotoca lateralis*) floated to the surface and were immediately eaten by birds (Washington State Ferries 2001). The Department of Ocean and Fisheries Canada related that mortality of juvenile salmon, perch, and herring occurred during impact driving of 36 inch steel piles at the Canada Place Cruise Ship Terminal in Vancouver, British Columbia. More recently, a number of shiner perch (*Cymatogaster aggregata*) and striped surfperch were killed during impact driving of 30 inch diameter steel pilings at the Winslow Ferry Terminal in Washington, (J. Stadler, NOAA Fisheries, pers. comm. 2002). Most of the dead fishes were the smaller *C. aggregata* and similar sized specimens of *E. lateralis*, even though many larger *E. lateralis* were in the same area. Dissections revealed that the swimbladder of the smallest of the fishes (80 mm FL) were destroyed, while those of the largest individual (170 mm FL) was nearly intact, indicating a size-dependent effect. The sound pressure levels that killed these fishes are not yet known. Of the reported fish-kills associated with pile driving, all have occurred during use of an impact hammer (*e.g.*, FRPD Ltd. 2001; WSF 2001; NMFS 2002; J. Stadler, NOAA Fisheries, pers. comm. 2002).

Research and field observations show that effects associated with pile driving can range from disruption of schooling behavior to fish death. Deleterious effects to listed salmonids in the Action Area would be minimized if the project proponent uses, to the fullest extent possible, vibratory pile-driving equipment. However, NOAA Fisheries realizes that this type of equipment has limited utility in project areas underlain by dense, hard, or compacted strata. Therefore, if impact hammer pile-driving equipment is used, in-water operations will only occur between June 30 and September 30 in the year(s) during which the project receives permit(s). Restricting in-water operations to this time period minimizes the potential for adverse effects to listed steelhead because adults and juveniles are least likely to be present in the Action Area during this work-window.

Monitoring of any pile-driving activity will be conducted as discussed (W. Sauriol, 2002 pers. comm.) using hydro-acoustic equipment to determine the peak pressure, the force used on the hammer and the distance from the pile. At this time, it is recommended that monitoring information is gathered at a minimum of two distances from the pile, 30 feet and 90 feet, and at two depths, mid-water and at the substrate.

2.1.3.2 Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur (50 C.F.R. 402.02). Indirect effects can occur outside the area directly affected by the action. Indirect effects can include other Federal actions that have not undergone Section 7 consultation but will result from the action under consideration. These actions must be reasonably certain to occur, or they are a logical extension of the proposed action. The indirect effects that would result from the proposed action include an increase in the amount of impervious surface and in the total backwater area available for salmonid predator habitat.

2.1.3.2.1 Increase in Impervious Surface and Stormwater Facilities

The proposed action will add 3.3 acres of new impervious surface, a relatively small increase in the Lower Yakima River watershed. The lower watershed is mostly rural and agricultural open area with space to restore vegetation within the watershed.

New or expanded roads add impervious surface to a watershed, potentially causing a variety of problems for fish if not properly addressed. As more impervious surface is added to the watershed, changes in water quality and hydrology that affect salmonid species are more easily detected. However the effects of added impervious surface in a watershed can be addressed in a variety of ways, including the treatment of stormwater delivered across the impervious area. Stormwater treatment facilities and other techniques can reduce those changes in water quality and quantity if they are designed with the project.

The proposed action addresses the potential effects of added impervious surface on watershed hydrology by including stormwater treatment facilities designed to treat and infiltrate all of the stormwater generated from two new bridges. Currently, stormwater is collected on the bridge and discharged directly into the Yakima River through bridge drains. The proposed action calls for routing water off the bridges into infiltration sites, the preferred method for treating added stormwater runoff from new impervious area. Proposed water quality treatment will remove pollutants and fine sediments from surface water. Infiltration will reduce the effects to the hydrology of the system and limit the increases in water temperature that would occur in detention facilities. The infiltration swales designed into the project will minimize effects associated with the added impervious surface. Accordingly, NOAA Fisheries believes that the effects of the increase in impervious surface is discountable.

2.1.3.2.2 Freshwater Predation on Juvenile Salmonids

Migrating juvenile salmonids travel downstream near the shorelines. Any in-water structure will create pools of slower water directly downstream, and near shore structures such as rocks, logs or rootwads, can also provide good hiding cover for predators. In the action area, salmonid predators use slackwater habitat and near-shore hiding cover to “ambush” juvenile salmonids.

Existing spread footings will be replaced with circular piers approximately 8 feet in diameter, 12 of which will be within the channel, six in the deepest portion of the river and six along the south shore. The six piers along the south shore will be outside the McNary pool water level but may be in-water during high flows. The replacement of the existing spread footings with circular piers will decrease the total area of slackwater in the channel, but will increase the number of contact points. The increased riprap on the left bank, taken with the increase in the number of potential predator ambush areas, creates the potential for increased predation on juvenile salmonids. As mentioned above, the effects of new riprap bank will be minimized by the use of smaller rock to stabilize the bank. Although the net extent of stabilized bank in the action area will increase by completion of the project, the net contribution of newly stabilized bank to predator cover in the area is small.

A study was initiated in 1997 to examine the impact of piscivorous fish on the survival of outmigrating smolts in the lower Yakima River (McMichael *et al*. 1998). Results indicated that predation rates were unnaturally high and were caused mainly by three predators: the indigenous northern pikeminnow *(Ptychocheilus oregonensi*s), found primarily above Prosser Dam, and two exotic piscivorous species, the smallmouth bass *(Micropterus dolomieu*i), found primarily below Prosser Dam, and perhaps the channel catfish *(Ictalurus punctatu*s), found primarily in and just above the Yakima River delta. Specific findings for the years 1998-2000 for smallmouth bass were as follows. Estimated abundance of smallmouth bass of piscivorous size increases from late March to a peak in late May. Most of this increase is due to immigration from the Columbia of prespawning adults. Peak abundance estimates for the lower Yakima from Prosser Dam to the mouth were about 40,000, 35,400 and 27,400 in 1998, 1999, and 2000, respectively. Consumption rates, expressed as the proportion of bass with an identifiable salmonid or salmonid bone in the gut, peaked in late May in all years, at about the peak of the fall chinook outmigration, at around 30%. Tabor (1993) conducted a study that indicated stomach contents of smallmouth bass (n=62) and northern pikeminnow (n=69) were subyearling chinook and crayfish respectively, only one steelhead prey was found. Another study in the lower Yakima River in 1998 (Haring 2001) revealed that juvenile chinook and steelhead represented 23% and 29% of the diet of northern pikeminnow and smallmouth bass respectively. These abundance and consumption rates are substantially higher than values reported for other Pacific Northwest systems. The higher values are attributed to relatively high temperatures that lead to physiologically faster digestion rates (and subsequently increased predation rates) the presence of irrigation dams, and a modified flow regime. In Tabor's study (1993) average prey size was less than three and one-half inches for smallmouth bass and five inches for northern pikeminnow (Tabor 1993). The average size for yearling steelhead smolts is greater than seven inches. Based on a predation study by Fritts *et al*. (2000) it appears that the majority of predation is experienced by the smaller, sub-yearling fall chinook during spring migration and that the dams upstream of the action area are the prime predation spots.

When taken as a whole, NOAA Fisheries believes the scientific literature relating to predator/prey behavior indicates that the addition of slow-water habitat likely increases predator success under certain conditions. The change from existing spread footings to circular piers, and the location of those piers in the channel will increase the number of potential contact spots for predator/prey interactions. Therefore, the project might cause increased predation of MCR steelhead. Even so, the increment of increased predation opportunity over that which already exists with the present bridge configuration is impossible to measure.

2.1.3.3 Population Scale Effects

As described in Section 2.1.2.2, NOAA Fisheries has estimated the median population growth rate (lambda) for MCR steelhead. Existing population growth trends are mainly affected by the influence of water regulation, physical barriers that prevent migration to historical spawning or rearing areas, water temperature barriers that influence the timing of emergence, juvenile growth rates, or the timing of upstream or downstream migration and hatchery fish. The effects of this proposed action include temporary, construction-related effects. These effects are reasonably certain to harm an unquantifiable number of MCR steelhead, although the harm will be minimized in the short term. Minimization will occur through a number of measures including the use of water quality best management practices, work timing restrictions or "windows," and work site isolation techniques. As a result, effects of the proposed action are not expected to have any significance at the population level.

2.1.4 Cumulative Effects

Cumulative effects are defined in 50 C.F.R. 402.02 as "those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." For this analysis, cumulative effects for the general action area are considered. Future Federal actions, including the ongoing operation of hatcheries, fisheries, and land management activities have been or will be reviewed through separate Section 7 consultation processes.

Subsequent residential or commercial development within the shoreline zone near the project is not anticipated due to regulatory constraints. In addition, the proposed bridge replacement is not designed to facilitate access to undeveloped areas. Cumulative effects to MCR steelhead from the foreseeable future state and local activities affecting the Yakima River and its shoreline area are anticipated to be limited. No other projects near the proposed site are known to be scheduled during the same time period.

2.1.5 Conclusion/Opinion

NOAA Fisheries' jeopardy analysis is based upon the present status of the species, the environmental baseline within the action area, the effects of the proposed action, and the cumulative effects. The analysis takes into account the species' status because determining the effect upon a species' status is the essence of the jeopardy determination. Depending on the specific considerations of the analysis, actions that are found likely to appreciably reduce numbers, distribution, or reproduction of the ESU, will be likely to jeopardize the continued existence of listed salmon.

NOAA Fisheries has determined that the effects of the proposed action will not jeopardize the continued existence of MCR steelhead. Jeopardize the continued existence of the species means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. The proposed action will cause short-term, direct effects. These effects are likely to be minimized through the use of Best Management Practices in design and construction. These practices include: 1) timing restrictions on in-water construction avoid affecting incubating eggs, 2) the installation of stormwater facilities to minimize the effects of increased impervious surface added to the Yakima watershed, and 3) replanting riparian or wetland vegetation removed during construction. Increased predation opportunity in not likely to affect steelhead as yearling steelhead smolts are generally larger than the preferred prey size for predators that might use those spots. All of these factors taken together enable NOAA Fisheries to conclude that the proposed action is not likely to appreciably reduce MCR steelhead numbers, reproduction, or distribution.

2.1.6 Reinitiation of Consultation

NOAA Fisheries conducted the foregoing analysis and developed the foregoing conclusion based on the description of the proposed action, including measures to reduce and avoid effects on MCR steelhead. This analysis also frames to assessment of the amount or extent of take presented below. Should the project not be conducted as described, and should any of the below-stated criteria be triggered, the action agency will be responsible for reinitiating consultation.

Consultation must be reinitiated if: (1) the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded, (2) new information reveals effects of the action may affect listed species in a way not previously considered, or (3) a new species is listed or Critical Habitat is designated that may be affected by the action (50 C.F.R.§ 402.16). The WSDOT must monitor the implementation of listed reasonable and prudent measures and terms and conditions of the incidental take statement. The WSDOT must reinitiate consultation if elements of the proposed project are implemented in a manner that is inconsistent with, or deviates from, the terms and conditions of this consultation. To reinitiate consultation, the WSDOT must contact the Habitat Conservation Division (Washington Branch Office) of NOAA Fisheries. If reinitiation is requested, the protective coverage of Section 7(o)(2) will lapse.

2.2 Incidental Take Statement

Section 9 of the ESA and Federal Regulation pursuant to Section 4 (d) of the Act prohibit the take of endangered and threatened species without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as spawning, rearing, feeding, and migrating (50 C.F.R. 222.106).

Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or applicant carrying out an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to, and is not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary; in order for the exemption in Section 7(o)(2) to apply, they must be implemented by the action agency. The WSDOT has a continuing duty to ensure that the action is implemented in accordance with this incidental take statement. If the WSDOT fails to comply with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and set forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of the Take

MCR steelhead are likely to be present in the action area during most, if not all of the year. Therefore, the incidental take of MCR steelhead, is reasonably certain to occur. Accordingly, the proposed action includes measures intended to minimize and avoid take. NOAA Fisheries prepared this Opinion and reached its conclusions based on the description of the proposed action, including measures to reduce and avoid effects on MCR steelhead. These measures have been restated in the Terms and Conditions to ensure the action agency understands that these measures are mandatory.

Despite the use of the best scientific and commercial data available, NOAA Fisheries cannot estimate a specific amount of incidental take of individual MCR steelhead. In such cases, NOAA Fisheries characterizes the expected level of take as "unquantifiable." However, to ensure that habitat effects and the attendant level of take do not exceed that anticipated in the Opinion, NOAA Fisheries has identified surrogate measures of the amount or extent of take that is authorized in this statement.

The extent of take authorized in this statement is limited to that which would occur from temporary water quality degradation 300 feet downstream of the point of construction, pile driving underwater sound/pressure waves with overpressure readings less than 75 kPa (14.7 psi), 100 feet of bank stabilization by use of riprap, and wetland fill less than one-half acre.

2.2.2 Reasonable and Prudent Measures

The following reasonable and prudent measures (RPMs) are non-discretionary. NOAA Fisheries believes that they are necessary and appropriate for minimizing take of MCR steelhead and must be implemented in conjunction with the conservation measures listed in the BA and the T&Cs that follow in order for the exemption in § 7(a)(2) to apply.

1. FHWA will ensure minimization of incidental take from and through worksite isolation activities.

2. FHWA will ensure minimization of incidental take from in-water construction activities.

3. FHWA will ensure minimization of incidental take from construction activities in or near the river or adjacent wetlands by minimizing the risk of effects from erosion and water pollution.

4. FHWA will ensure minimization of incidental take from effects on riparian and instream habitat.

5. FHWA will ensure minimization of incidental take from effects of in-water construction and habitat modification by monitoring construction and activities and planting success rates.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of Section 9 of the ESA, the FHWA must ensure that WSDOT complies with the following terms and conditions, which implement the RPMs described above. Implementation of the terms and conditions within this Opinion will minimize the effects of project activities on MCR steelhead and their habitat, thereby reducing the effects of take. These terms and conditions are non-discretionary.

1. To implement RPM No. 1 (isolation and fish handling) above, the FHWA will ensure that:

   a. Probability of encountering listed fishes will be reduced to the maximum extent possible by conducting in-water construction only within the fish work window of June 30 to September 30. Any pile driving conducted from September 15-30 will require additional mitigation using sleeves or a bubble-curtain. Any additional extensions of the in-water work period must be coordinated with NOAA Fisheries and WDFW.

   b. The work area will be well isolated from the flowing stream using the measures described in the BA ("cans") which are incorporated here by reference.

   c. Any listed fish that may be trapped within the isolated work area will be captured and released using appropriate methods, including supervision by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of MCR steelhead.

   d. Captured fish must be released outside the isolated work area as near as possible to the capture area.

   e. All take of listed salmonids during work area isolation must be documented and reported using the format attached in Appendix 1. FHWA will ensure that NOAA Fisheries receive the monitoring reports of take within one month beginning when the initial work area isolation activities commence until in-water construction activities cease. The reports will be sent to NOAA Fisheries, Attention Diane Driscoll, 510 Desmond Drive SE, Suite 103, Lacey, WA 98503. All salmonid carcasses will be collected and delivered to NOAA Fisheries to be identified, at FHWA's expense.

2. To implement RPM No. 2 (construction within the OHWM) above, the FHWA will ensure that:

   a. All work within the active channel is completed between June 15 and September 30. Any pile driving conducted from September 15-30 will require additional mitigation using sleeves or a bubble-curtain. Extensions of the in-water work period will first be requested in writing, approved by, and coordinated with NOAA Fisheries and WDFW.

   b. All in-water work must occur when water temperatures meet or exceed 70º F. If water temperatures drop below 70º F, then in-water work must cease until temperatures return to a minimum of 70º F.

   c. If steel piles are used, hydroacoustic monitoring shall take place. The hydroacoustic monitoring will include the following elements:

      i. Underwater sound levels monitored at mid-water and substrate depth and 30 and 90 feet distance from the pile driving site. If levels exceed 75kPa , WSDOT will notify NOAA Fisheries within 24 hours. The WSDOT will notify the FHWA and NOAA Fisheries of the hydroacoustic monitoring from the first five piles within 72 hours.
      ii. Based on the outcome of the above described hydroacoustic monitoring, an appropriate sound attenuation minimization measure, such as one of the following, will be employed. Methods to minimize the underwater sound pressure level may include reducing the force of each strike, or attenuating the underwater sound by enclosing the pile in a pile sleeve or use of an air bubble curtain.
      iii. A report will be submitted to the FHWA and NOAA Fisheries within 30 days of completion of the pile-driving that presents the results of the hydroacoustic monitoring conducted. The following data will be provided in the report: size and type of pile; approximate energy supplied to the pile; frequency and amplitude of the underwater sound; angle of the pile; water depth, distance from shore or bulkhead; and type and depth of substrate.
      iv. Piles will be removed by vibratory hammer, direct pull or cutting/breaking the pile below the substrate. Removal using clam shell grab technique is not approved. All instream pile driving activities will be completed from June 30 to September 15. Pile driving activities from September 15 to September 30 will require sleeves or air bubble curtains for mitigation.

   d. All vehicles operated with 150 feet of any water body must be inspected daily for leaks and, if necessary, repaired before leaving the staging area. All equipment operated instream must be cleaned to remove all external grease, dirt, and mud before operations below the bankfull elevation. Wash and rinse water will not be discharged into streams and rivers without adequate treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.

e. Stationary power equipment operated within 150 feet of any stream or wetland will be protected to prevent leaks as specified in the JARPA (on file).

f. Material removed during excavation will only be placed in a way that prevents it from eroding back into the channel.

3. To implement RPM No. 3 (construction activities adjacent to water bodies/wetlands), the FHWA will ensure that:

a. All temporary erosion and sediment control (TESC) and pollution control measures included in the BA are included as provisions in the contract. Boundaries of clearing limits associated with site access and construction will be clearly marked to minimize disturbance. All sensitive habitat areas to be protected will be clearly marked. During pre-construction meetings, the contractor will be made aware of the types of activities not allowed in sensitive areas. The contractor will be required to have a Spill Prevention Control and Containment Plan (SPCCP) and a Temporary Erosion and Sediment Control Plan (TESCP) reviewed by the WSDOT and FHWA and in place prior to the start of any construction activities. The TESC plan will outline how and to what specifications various erosion control devices will be installed to meet water quality standards, and will provide a specific inspection protocol and time response. The TESC plan will be included in the project plans and implemented by the Contractor. The plan will address access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and materials storage sites, fueling operations, staging areas, cement, mortars and bonding agents, hazardous materials, spill containment and notification, construction debris, and inspection and replacement of erosion controls. Erosion control measures will be sufficient to ensure that water quality conditions do not negatively impact MCR steelhead.

b. The Contractor develops an adequate, site-specific Spill Prevention and Countermeasure or Pollution Control Plan (PCP), and is responsible for containment and removal of any toxicants released.

c. Construction within the project vicinity will not begin until all temporary erosion controls (*e.g.*, sediment barriers and containment curtains) are in place. Erosion control structures will be maintained throughout the life of the contract.

d. Boundaries of clearing limits associated with site access and construction will be marked to minimize disturbance of riparian vegetation, wetlands and other sensitive sites.

e. A supply of emergency erosion control materials will be on hand, and temporary erosion controls will be installed and maintained in place until site restoration is complete.

f. Heavy equipment will be limited to that with the least adverse effects on the environment, *e.g.*, minimally sized vehicles.

g. Vehicle staging, cleaning, maintenance, and overnight storage of vehicles and fuel storage will be in a designated area, 150 feet or more from any stream, water body or wetland.

h. All machinery fueling and maintenance will take place in a designated area 150 feet or more from any stream, waterbody or wetland. The only exception to this is the large cranes that will be located on the work trestles. Because of the reduced mobility of these cranes, this equipment can be fueled in place with full containment systems at the discretion of the project engineer in consultation with WSDOT environmental staff and NOAA Fisheries.

i. All disturbed soil will be replanted with a native seed mix. Erosion control planting will be completed within three days of the end of construction, unless covered or otherwise stabilized with appropriate erosion and sediment control measures.

j. All temporary access roads will be obliterated when the project is completed, the soil stabilized and the site revegetated. Areas compacted during construction activities, will be restored to pre-project infiltration capabilities, as described in the WSDOT Highway Runoff Manual.

k. Temporary roads in wet or flooded areas must be abandoned and restored by the end of the in-water work period.

l. Riprap used for bank protection will be clean, the minimum possible size, and will be “placed,” not dumped.

m. Boulders, rock, large wood and any other natural construction materials will be obtained outside the riparian buffer area. Material removed during excavation will only be placed in a manner that prevents it from eroding back into the channel.

n. Measures will be taken to prevent construction debris from falling into the river, wetland or riparian area. Any material that falls into a stream or wetland during construction operations will be removed in a way that causes minimum ground disturbance and maintains water quality. Treated wood debris and treated wood removed as part of a project will be handled and disposed of as appropriate for this type of hazardous material.

o. Any large wood, native vegetation, weed-free topsoil, and native channel material displaced by construction must be stockpiled for use during site restoration.

p. Any water intakes used for the project will have a fish screen installed, operated and maintained according to NOAA Fisheries' fish screen criteria. http://www.nwr.noaa.gov/1hydrop/pumpcrit1.htm

q. Construction discharge water will be: (1) collected and transported to an approved location for treatment, (2) pumped to an upland site at least 300 feet from any waterbody or, (3) to an upland site providing equal or better filtration capacity (as the 300 feet) for appropriate treatment as stated in the BA.

r. Temporary artificial lighting used for night shifts will be directed toward working surfaces away from the water and will be equipped with external glare shields.

4. To implement RPM No. 4 (riparian and wetland habitat protection), the FHWA will ensure that:

a. Alteration of native vegetation is minimized. Where native vegetation will be altered, measures will be taken to ensure that roots are left intact (*e.g.*, in temporary fill). This will reduce erosion while still allowing room to work.

b. Alteration or disturbance of stream banks and existing riparian vegetation is minimized by implementing the following procedures: any instream large wood or riparian vegetation moved or altered during construction will stay on site or be replaced with a functional equivalent; all tree removal will be mitigated for onsite by a two-to-one ratio; and any native channel material, topsoil, and vegetation removed will be stockpiled for redistribution in the project area.

c. Riparian vegetation removed will be replaced with a mix of native seeds, shrubs, and trees. Replacement will occur within the project vicinity and according to the timing guidelines set out in the WSDOT Highway Runoff Manual. Revegetation prescription guidelines will be as specified in the BA (species, size, protection, maintenance, replacement and survival rate).

d. Clean riprap placed to protect the bridge abutments will be backfilled with clean topsoil and planted with native species. Revegetation will be conducted according to the BA planting prescription guidelines and the WSDOT Highway Runoff Manual (timing, species, size, protection, maintenance, replacement and survival rate).

e. No surface application of nitrogen fertilizer is used within 50 feet of any water of the State, in the action area.

f. Vehicles and machinery must cross riparian areas and streams at right angles whenever possible.

5. To implement RPM No. 5 (monitoring), FHWA will ensure that:

a. NOAA Fisheries, Washington Habitat Branch, receive in-water construction monitoring reports as described in T&C 2.f.

b. Erosion control measures as described above in RPM No. 4 will be monitored.

c. All significant riparian planting areas are monitored yearly for three years to ensure that finished grade slopes are at stable angles of repose and plantings are surviving satisfactorily (80% survival over three years).

d. If the success standard specified above in T&C 5.c is not achieved, dead plantings will be replaced to bring the site into conformance. If failed plantings are deemed unlikely to succeed, replacement plantings will be conducted at other appropriate locations in the project area.

e. By December 31 of the year following the completion of construction, the FHWA will submit a monitoring report with the results of the monitoring required in terms and conditions 5.a and 5.b above. Send the report to NOAA Fisheries, Attention Diane Driscoll, 510 Desmond Drive SE, Suite 103, Lacey, WA 98503.

f. In each of the two years following completion of construction, the FHWA will submit to NOAA Fisheries (Washington Branch) a monitoring report with the results of monitoring requirements of 5.c and 5.d above. Send the report to NOAA Fisheries, Attention Diane Driscoll, 510 Desmond Drive SE, Suite 103, Lacey, WA 98503

2.3 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or action area, to help implement recovery plans, or to develop additional information.

NOAA Fisheries must be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed species or their habitat. Accordingly, NOAA Fisheries requests notification of the implementation of any conservation recommendations.

3.0 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));

- NOAA Fisheries will provide conservation recommendations for any Federal or State activity that may adversely affect EFH (§305(b)(4)(A));

- Federal agencies will within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response will include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. For a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency will explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 C.F.R. 600.110). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g*., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 C.F.R. 600.810).

Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies regarding any activity that may adversely affect EFH, regardless of its location.

The objective of this EFH consultation is to determine whether the proposed action may adversely affect designated EFH, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse impacts to EFH resulting from the proposed action.

3.2 Identification of EFH

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Federally-managed Pacific salmon: chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in

Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of the impacts to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Actions

The proposed action and action area are detailed above in Section 1.3 of the Opinion. The action area includes habitats designated as EFH for various life-history stages of coho and chinook salmon. The area is used by each of these salmonids in the same way that it is used by MCR steelhead. Therefore, the analysis of effects in the Biological Opinion is applicable in the EFH consultation.

3.4 Effects of Proposed Action

As described in detail in Section 2.1.3 of this Opinion, the proposed activities may result in detrimental short and long-term effects to a variety of habitat parameters. These adverse effects are:

1. Short-term degradation of water quality in the action area because of an increase in turbidity during in-water construction and the potential for contaminants to reach the water.

2. Short-term degradation of habitat because of filling of one-half acre of existing wetlands adjacent to the right bank and construction activities associated with creation of new access roads and wetlands beneath the new structures.

3. Potential increase in predation on outmigrating subyearling juvenile chinook and coho. Increased slackwater effects will be created by various in-water structures.

4. Potential disruption of outmigration patterns for chinook and coho because of lighting used for night construction work and unprotected pile-driving activities in the stream channel from June 30 to September 15.

3.5 Conclusion

NOAA Fisheries believes that the proposed action may adversely affect designated EFH for coho and chinook salmon.

In-water construction activities are expected to occur on a 24-hour basis. Use of lights on the temporary bridge platforms could disrupt smolt migration behavior. Pile driving without using sleeve casings or an air bubble curtain to mitigate the expected sound pressure effects is likely to disrupt downstream smolt migration behavior. New and temporary in-water structures are likely to increase predation opportunities that could contribute to an incremental, albeit unmeasurable reduction in the survival of EFH salmonids through increased predation.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions that may adversely affect EFH. While NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the FHWA, it does not believe that these measures are sufficient to fully address the adverse impacts to EFH described above. Consequently, NOAA Fisheries recommends that the FHWA implement the following conservation measures to minimize the potential adverse effects to EFH for chinook and coho salmon:

1. Implement Terms and Conditions 2.c through 2e, 3.c, 3.e, 3.g, 3.h, 3.r, and 5.b as described in Section 2.2.3, to minimize EFH adverse effects No.1 (water quality).

2. Implement Terms and Conditions 3.c and 3.d, 3.d, 3.f, 3.g, 3.h, 3.j, 4.b, 4.c, 4.f, 4.g, 5.c and 5.d as described in Section 2.2.3, to minimize EFH adverse effects No.2 (riparian and wetland habitat).

3. Minimize the predation effect to non-listed subyearling chinook and coho by further restricting the in-water work window from July 15 to September 15. As described in Section 2.1.1.1 the ESA listed Yakima River juvenile steelhead population demonstrates an out-migration timing that begins in February and extends into mid-June. Non-listed juvenile chinook exhibit a slightly different outmigration schedule, from April until mid July. By moving the in-water work window the minimum number of outmigrating chinook will experience the slackwater habitat created by the temporary "cans" (isolating structures).

4. To minimize the effects of artificial lighting on the river, temporary lighting used for night shift activities will be directed toward working surfaces, away from the river, and will be equipped with external glare shields (T&C 3.s). Effects of pile driving on out-migrating chinook and coho smolts WSDOT would be minimized by the use of "sleeves" or casings to enclose the piles being driven or air bubble curtains to minimize the sound pressure effects. Although fish movement normally occurs during both daylight and nighttime hours, cessation of work for a period a night would provide a relatively quiet "window" for holding fish to move through the work area.

3.7 Statutory Response Requirement

Please note that the MSA and 50 C.F.R. 600.920(j) require the Federal agency to provide a written response to NOAA Fisheries' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity. In the case of a response that is inconsistent with the EFH Conservation Recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

The FHWA must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 C.F.R. 600.920(k)).

APPENDIX 1

In-Water Construction Monitoring Report : SR 240 Yakima River Bridge Scour Project

Start Date: _______________
End Date: ________________

Waterway: _______________
Water Temperature: ___________

Construction Activities:
____
____
____
____
____

Number of fish observed: ___________
Number of salmonid juveniles observed (what kind?): ___________________________________
Number of salmonid adults observed (what kind?): ______________________________________

What were fish observed doing prior to construction?___________________________________
____
____

What did the fish do during and after construction? ____________________________________
____
____
____

Number of fish stranded as a result of this activity: __________

How long were the fish stranded before they were captured and released to flowing water?
____
____
____

Number of fish that were killed during this activity: __________

Send report to:
National Marine Fisheries Service, Attention Diane Driscoll, Washington State Habitat Branch, 510 Desmond Dr. SE, Suite 103, Lacey, WA 98503

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